

Abstract

Immortalized cell lines have been crucial in cell research and our understanding of diverse cellular functions in different organisms. Most cells from multicellular organisms typically do not proliferate indefinitely, and ones that survive to form immortalized cell lines must carry mutations to allow this type of growth. *Botryllus schlosseri*, of the tunicate family, is the closest living invertebrate relative to vertebrates, with similarities in homeostasis and adult stem cells. Its unique colony life cycles and clonal replicates make it invaluable to stem cell research as well as advancing knowledge/testing in cell aging; however, to date, no cell lines from *B. schlosseri* exist. In an attempt to create an immortalized cell line from this organism, we aim to induce DNA breakage and slow repair mechanisms enough to promote DNA mutation; without killing the organism. To accomplish this, we obtained wild colonies, isolated animals from their tunics, and exposed them to low, non-lethal, concentrations of a genotoxic agent and ionizing radiation and then incubated the organisms for five days with a tumor promoter aimed at slowly degrading the DNA repair mechanisms. Proliferation following exposure was measured via area of adherent cells growing on the culture dish. We found that cells adhered initially, however there was no evidence of proliferation following exposure.

This work, although it did not yield a cell line, will still allow us to assess levels of DNA damage induced by our treatments, which can inform future experiments with uncontaminated colony specimens to produce the desired immortalized cell lines.